

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1. (Currently amended) [[::]] A method of measuring a signal transit time in a medical liquid required by a signal to pass through a measurement zone from an ultrasonic transmitter (2) to an ultrasonic receiver (3), wherein in which a line carrying the medical liquid is arranged in the measurement zone, ~~or for measuring changes in the signal transit time, whereby comprising emitting a step-like signal (10) with the ultrasonic transmitter (2) emits a step like signal (10), and such that~~ the step-like signal (10) passes through the measurement zone, resulting in an oscillation-like received signal (12)[[,]] oscillating about a resting level (11) on the ultrasonic receiver (3), the received signal being sampled at regular intervals Δt and detected,

checking the oscillator-like received signal (12) ~~is checked~~ on the basis of a selection criterion at least during a half-period (14, 15) to determine whether it the oscillator-like received signal (12) is the received signal produced by the step-like signal (10), and

when the result of this check is positive, determining the signal transit time or the change in the signal transit time is determined with ~~the help of~~ an interpolated or extrapolated contact point (20, 21) of the oscillator-like received signal (12) with the resting level (11) in a received signal-time diagram.

Claim 2. (Currently amended) [[:]] The method according to Claim 1, characterized in that wherein for determining the signal transit time, the point used as the interpolated or extrapolated contact point is the point (21) in the received signal-time diagram at which the oscillator-like received signal (12) at the beginning of the first half-period (14) differs from the resting level (11)[[,]] and ~~the signal transit time is derived from the signal transit time thus determined.~~

Claim 3. (Currently amended) [[:]] The method according to Claim 1, characterized in that wherein for determining the change in signal transit time, the point (20) in the received signal-time diagram at which the oscillator-like received signal (12) intersects the resting level (11) after the first half-period (14) is determined as the interpolated or extrapolated contact point[[,]] and ~~the change in signal transit time is derived from the time thus determined.~~

Claim 4. (Currently amended) [:] The method according claim 1,
~~characterized in that the~~ wherein an area enclosed between the
oscillator-like received signal (12) and the resting level (11) is
determined during the half-period (14).

Claim 5. (Currently amended) [:] The method according to Claim 4,
~~characterized in that~~ wherein the area thus determined is compared
with a reference value as the selection criterion.

Claim 6. (Currently amended) [:] The method according to Claim 4,
~~characterized in that~~ wherein the subsequent half-period (15) is
also sampled and detected, and the area enclosed between the
oscillator-like received signal (12) and the resting level (11) is
determined during the subsequent half-period (15).

Claim 7. (Currently amended) [:] The method according to Claim 6,
~~characterized in that~~ wherein the area enclosed between the
oscillator-like received signal (12) and the resting level (11) is
compared with a reference value as the selection criterion during a
subsequent half-period (15).

Claim 8. (Currently amended) [:] The method according to claim 1,
~~characterized in that the~~ wherein an extreme value (18) of the
oscillator-like received signal (12) is determined during the half-
period (14) and is compared with a reference value.

Claim 9. (Currently amended) [:] The method according to Claim 8,
~~characterized in that wherein~~ the subsequent half-period (15) is sampled and detected and ~~the an~~ extreme value (19) of the oscillator-like received signal (12) is determined during the subsequent half-period (15) and compared with a reference value.

Claim 10. (Currently amended) [:] The method according to claim 1,
~~characterized in that wherein~~ the duration of one or more half-periods (14, 15) of the oscillator-like received signal (12) is determined as the selection criterion and is compared with a reference value.

Claim 11. (Currently amended) [:] The method according to claim 1,
~~characterized in that wherein~~ the resting level (11) is determined as the average of received signal samples (13) preceding the half-period (14).

Claim 12. (Currently amended) [:] The method according to Claim 4,
~~characterized in that wherein~~ the ~~areas thus area~~ determined ~~are is~~ analyzed as a measure of the attenuation of the signal.

Claim 13. (Currently amended) [:] The method according to claim 1,
~~characterized in that wherein~~ the medical liquid is blood, dialysis dialysis liquid or an infusion liquid.

Claim 14. (Currently amended) [:] A device for use of the method according to claim 1, comprising

an ultrasonic transmitter (2) for emitting the step-like signal (10),

an ultrasonic receiver (3) which is separated from the ultrasonic transmitter (2) by the measurement zone for delivering a received signal (12) which oscillates about a resting level (11) as the response to the step-like (10) signal passing through the measurement zone,

a line (1) arranged in the measurement zone carrying a medical liquid,

an analyzer unit (6) that is connected to the ultrasonic transmitter (2) and the ultrasonic receiver (3),

whereby the analyzer unit (6) receives receiving synchronized signals for sending the transmission signal and has having a sampling device for sampling and storing the oscillator-like received signal (12) at regular intervals Δt ,

whereby the analyzer unit (6) is ~~also suitable being~~ configured for checking on the oscillator-like received signal (12) on the basis of a selection criterion at least during a half-period (14, 15) to determine whether the signal is the received signal caused by the step-like signal (10), and

if the result of the test is positive, ~~to determine for~~ determining the signal transit time or the change in the signal transit time of an interpolated or extrapolated contact point (20, 21) of the oscillator-like received signal (12) with a resting level (11) in a received signal-time diagram.

Claim 15. (Currently amended) [:] The device according to Claim 14, ~~characterized in that~~ wherein the analyzer unit (6) is also suitable configured for analyzing at least one of the signal transit time ~~and/or~~ and the change in signal transit time as a measure of at least one of the composition ~~and/or~~ and the change in composition of the medical liquid on the basis of stored information.

Claim 16. (Currently amended) [:] The device according to ~~Claims~~ Claim 14, ~~characterized in that~~ wherein the medical liquid is blood, dialysis liquid or an infusion liquid.

Claim 17. (Currently amended) [:] The device according to Claim 16, ~~characterized in that it~~ wherein the device is a blood volume sensor.

Claim 18. (Currently amended) [:] The device according to Claim 17, ~~characterized in that it~~ wherein the device is the blood volume sensor also and an air detection sensor.